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CLASSIFICATION CONFIDENTIAL

CENTRAL INTELLIGENCE AGENCY 25X1 REPORT NO. [redacted]

SECURITY INFORMATION

INFORMATION REPORT

CD NO. 25X1

COUNTRY USSR (Gorki Oblast)

DATE DISTR. 15 Feb 1952

SUBJECT Kalinin Chemical Plant in Dzerzhinsk

NO. OF PAGES 4

25X1C

NO. OF ENCLS. 2 (LISTED BELOW)

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SUPPLEMENT TO REPORT NO.

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1. The Kalinin Chemical Plant was south of the double-track Dzerzhinsk-Gorki railroad line. The plant had its own railroad stop, called Chernorechenski Khimkombinat, located about 50 meters opposite the western main entrance. It was 4 km east-northeast from the Dzerzhinsk (56°14'N/43°30'E) main railroad station. The plant was on a railroad siding which came from the Dzerzhinsk Railroad Station, branched-out into several tracks in the plant area, and continued in a northeasterly direction to the Igumnovo (56°16'N/43°37'E) Railroad Station. North of the main railroad line was the Dzerzhinsk-Gorki highway. The highway had a streetcar line and was asphalted as far as the Rulon Plant. A narrow-gauge railroad line, about 1 km long, connected the plant area with a ship anchorage in the Oka River. *

2. The plant was called Khimicheski Zavod Kalinin (Kalinin Chemical Plant). Construction of the plant started in 1915. Production began in October 1916. The plant installations were greatly expanded between World War I and II. The fenced-in plant covered an area about 1,200 meters long and about 480 meters wide at the western end and 700 meters wide at the eastern end. The plant consisted of installations for the production of sulphuric acid, chlorine and chlorine compounds, nitrogen and nitrogen compounds, soda, caustic soda, phosphorus and phosphorus compounds, hydrogen and hydrogen peroxide, oxygen, carbonic acid, barium peroxide, barium chloride, green and blue vitriol, burnt lime, calcium carbide, mixed fertilizers, clay compounds, camphor, ethyl and methyl alcohol, acetic anhydride, explosives, and warfare agents. In addition to several administration and messhall buildings, the plant also had a technical college for the training of apprentices, various kinds of workshops including a foundry, transformer installations, a boilerhouse used to generate steam for heating, as well as several tank installations. The old buildings generally appeared neglected. There were some new structures which were built after the war. **

3. The plant produced sulphuric acid, elementary sulphur, chlorine in gaseous and liquid form, hydrochloric acid, chloric acid, calcium chloride, atmospheric nitrogen, ammonia, nitric acid, ammonium nitrate, ammonium sulphate, ammonium carbonate, ammonium phosphate, nitroglycerin, and probably also nitrocellulose, urea and thiocarbamine, hydrogen and hydrogen peroxide, oxygen, carbonic acid, soda and caustic soda, yellow and red phosphorus, superphosphate, phosphoric acid, phosphorus pentoxide, phosphorus

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chlorine compounds, synthetic mixed fertilizers, burnt lime, nitrogen of lime, calcium carbide, and probably also silicon carbide, alumina abrasives, synthetic rubies, barium chloride, barium peroxide, ethyl and methyl alcohol, camphor, acetic anhydride acetone, raw materials for explosives and explosives on nitric acid basis, and warfare agents. ***

4. The plant processed the following raw materials: common salt originating from the Baskunchak and the Elton Lake, shipped to the plant on Volga barges or by rail from Gorki; apatite coming from the Kola Peninsula; phosphates coming from the Kirov (58°33'N/49°42'E) area; and limestone coming by ship from the Kuibyshev (53°12'N/50°09'E) area. Hard coal shipments came mainly from the mines near Kisel (59°03'N/57°40'E) in the Urals and anthracite shipments from Artemovsk (48°36'N/38°00'E) in the Donets Basin. Also pyrites, large stocks of heavy spar (barium sulphate), turpentine, and benzol were processed.

5. The plant received its electric power from the TETS Power Plant, located 6 km to the east. The TETS Power Plant, together with the municipal power plant in Gorki and the large power plant in Balakhna (56°28'N/43°37'E), supplied Dzerzhinsk and its industries. Water was supplied from the Chernaya Rechka River through a large filter installation near the plant.

6. The manager of the Kalinin Plant was Kaganovich, (fnu), allegedly a relative of the Soviet politician of the same name. Kaganovich also was apparently manager of all chemical plants around Dzerzhinsk. Forcibly enlisted German civilian engineers and chemists were employed in the Kalinin Plant. The number of employees was approximately 3,000, not included the loading workers at the harbor installations. Fifty to sixty percent of the workers were women.

7. Smoking was strictly prohibited in the entire plant area. In some buildings workers were submitted to a special search for matches. In many installations workers wore protective clothing, gas and dust masks. The plant was surrounded by a wooden fence with several watch towers. Along the wooden fence ran a barbed wire fence. There was a passage, 3 meters wide, between the two fences which was patrolled by the military guard. The interior of the plant was controlled by civilian guards. Some buildings had a special guard.

25X1 * [redacted] Comment. For location sketch of this plant, see Annex 1, based on aerial photographs, town plans, and information from sources.

25X1 ** [redacted] Comment. The construction of the Kalinin Chemical Plant as a sulphuric and nitric acid factory started early in 1915 due to the increased requirements for these acids by the explosive industries during World War I. In October 1916 the installations had a daily production of 20 tons of sulphuric acid and 9 tons of nitric acid. The plant was continuously expanded and modernized in the following years and the production of a number of additional chemical products was started. Regular production of nitrogen compounds, chlorine, phosphorus, and their compounds was not started until about 1930. Considerable technical difficulties were encountered in almost all branches of production. Efforts were made to overcome these difficulties by alteration and new structures. A better designed plant to produce about the same type of items was being built near this plant before the last war. For layout sketch of the plant, see Annex 2, based on aerial photographs and information from sources.

25X1 *** [redacted] Comment. The following information was obtained from previous records: For a long time the sulphuric acid department was operated with inadequate lead chamber installations (Bleikammeranlagen) which were completely renovated later on. The department was expanded by a tower installation, and in 1934 by a contact installation, which was allegedly operated by using the sulphur dioxide obtained from the fumes of the entire plant. Twelve

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roasting furnaces for the roasting of pyrites have been in operation since 1929 when these installations were expanded. The chloric alkali electrolysis department producing chlorine and caustic potash was operated with a Siemens-Billiter installation set up in 1935. Recently this department also appeared to have used electrolytic mercury detectors. The total wartime capacity of chlorine was estimated at 40,000 tons per year for Dzerzhinsk. However, it is not known whether this figure refers only to the Kalinin Plant or also includes the production of Plant No 96. At any rate, the present total capacity is much higher. There was also a chloric gas liquefying plant. No information is available on the production of hydrochloric acid, but it appears to be considerable according to recent information. Inscriptions on tank cars also revealed that chloric acid was produced in the installations. The ammonia synthesis installation, which was the nucleus of the plant, started production 1928 on a limited scale. It was originally operated by the Casale high pressure circulation procedure (nach dem Hochdruck-Umwaelzverfahren nach Casale), with no preliminary catalysis. The related hydrogen production was achieved by the Pintsch method on the basis of water gas. It was the first atmospheric nitrogen installation in the U.S.S.R. The gas compression was done by nine high-pressure compressors of 6 stages each, for 675 atmospheres, operated by electric motors. After the second compression stage the gases were purified by condensers and oil separators. Additional compressors in operation included a four-stage compressor produced by the Machine Factory in Saerth near Cologne, operating on the Linde method; a six-stage compressor from St.Giorgio and several compressors from [illegible] St. Giorgio. The hydrogenation installation consisted of eight hydrogenation columns, each equipped with one electric contact furnace (Elektrokontaktofen), one condenser and one purifier. There were two nitrogen tanks, each 16 meters high and with a capacity of 3,000 cubic meters, two hydrogen gas tanks of the same dimensions and one mixed gas tank, 16 meters high and with a capacity of 10,000 cubic meters. An additional gas mixing installation consisted of 3 regulators and 3 mixers. Siderite ($FeCO_3$) was used as a catalyzer. After an installation for preliminary catalysis and new contact installations were added, the daily capacity of the ammonia synthesis plant increased to 160 to 200 tons of ammonia, corresponding to an annual nitrogen production of 40,000 tons. The ammonia oxidation (Ammoniakverbrennung) installation for the production of nitric acid was not put into operation until 1932. Previously, the acid was produced from salpeter. The ammonia oxidation installation was operated by the following two methods: the American excess pressure method of Du Pont De Nemours and the German normal pressure method of the Bamag-Meguin Company. The installations originally had a monthly capacity of about 3,000 tons of weak nitric acid (about 1,000 tons concentrated nitric acid) corresponding to a pure nitrogen content of about 220 tons. Later, the monthly nitrogen production increased to 600 tons, and at the end of the war, this figure has probably been doubled. Several steel towers arranged in batteries were used for nitric acid adsorption. In 1931 or 1932, the installation for the production of ammonium nitrate started production with a monthly capacity of almost 1,000 tons comprising a nitrogen content of about 160 tons. The equipment used in this installation was of Soviet origin. The installations for the production of ammonium sulphate and ammonium phosphate as fertilizers were also of Soviet origin. The initial annual capacity of these installations was 15,000 tons of ammonium sulphate and 3,500 tons of ammonium phosphate. Both installations originally operated testing installations. They had a working relationship with the department for research of nitrogen fertilizers which was attached to the plant. According to sources, there were large incoming shipments of heavy spar which would indicate that hydrogen peroxide was produced from barium peroxide obtained from the heavy spar ($BaSO_4$). Oxygen was produced in three installations which had a capacity of at least 7,000 cubic meters daily. The production was achieved by the fractional distillation of air liquefied by four compressors of Italian origin and four other appliances (Aggregaten) from the Linde firm in Hoellriegelskreuth.

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Yellow phosphorus was produced in electric furnaces by mixing crude phosphate with quartz sand. Part of the phosphorus was processed into red phosphorus. The prewar red phosphorus capacity was 500 tons a year. The superphosphate department was gradually increased during the twenties. Its capacity was originally 1,263 tons a year in 1932 and reached 100,000 tons a year in 1930. Since about the beginning of the war, the actual production exceeded 120,000 tons. The calcium carbide department was operated with four electric furnaces and had a theoretical capacity (sic) of 20,000 tons per annum. An installation producing nitrogen of lime worked closely with the carbide department. Since 1931 this installation operated on the method of the Stockholm Superphosphate Fabriks A.B. and had an annual capacity of about 20,000 tons of calcium cyanamide. Synthetic rubies were produced in a special building. They were used as bearings for watches and precision measuring instruments as well as for drill bits. About 200 electric arc burners were used to smelt candle-shaped pieces of synthetic rubies, 1 to 10 cm long. In one section of the building were 4 furnaces which were 2.5 meters high and 2 meters square at the base. They were used probably for the production of silicon carbide. Alumina abrasives were probably produced on the upper floor of this plant building.

2 Annexes: 2 - sketches on ozalid.

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Location Sketch of the Kalinin Chemical Plant in Dzerzhinsk.

Legend:

1. Dzerzhinsk town area.
2. Krasnoarmeysk Uchastok workers' settlement.
3. Village of Zholnino.
4. Village of Chernorechye.
5. Krasnyi Khimik workers' settlement.
6. Voroshilovski Uchastok workers' settlement.
7. Workers' settlement.
8. Zholnino railroad station on the Vladimir-Gorki double-track railroad line.
9. Dzerzhinsk main railroad station.
10. Chernorechenski Khimkombinat Kalinin train stop.
11. Igumnovo shunting station.
12. Rulon train stop.
13. Doskino railroad station.
14. Yava Chemical Plant.
15. Stalymost factory for concrete parts (Detonteile) and steel structures.
16. Rulon Chemical Plant.
17. TETS Power Plant.
18. Oka Chemical Plant.
19. Clarifying basins for sewage water.
20. Zavod Stroy Chemical Plant No 96.
21. Kalinin Chemical Plant.
22. Transformer station.
23. Streetcar station.
24. Lime sandstone factory.
25. Sawmill.

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26. Bread factory.

27. Sverdlov Explosive Plant No 80.

28. Range.

29. Peat processing plant.

30. Moscow-Gorki main highway.

31. Ship anchorage and slag dumps.

32. Narrow-gauge feeder line.

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Layout Sketch of the Kalinin Chemical Plant in Dzerzhinsk.

Legend:

1. Messhall, about 30 x 15 meters.

2. Residence of the manager Kaganovich; multiple-story structure, about 40 x 15 meters.

3. Administration building, multiple-story structure, about 40 x 15 meters and 30 x 15 meters.

4. Gate entrance where identity papers were checked.

5. Three-story guardhouse, about 20 x 10 meters.

6. Old wooden cooling tower, not in operation, about 25 meters high, and 15 meters in diameter at the base.

7. Multiple-story office building, probably housing part of the technical management, about 20 x 15 meters.

8. Three-story structure, about 80 x 30 and 10 meters, in which synthetic rubies were produced to be used as bearings for watches and precision measuring instruments, as well as for drill bits. It was equipped with about 200 electric arc torches. In the southern annex building, which was about 30 meters wide, there were four furnaces each 2 x 2 x 2.5 meters. They were used for the production of silicon carbidd. Alumina abrasives were produced in a section of the upper floor. Many small water fountains were arranged around the building for cooling the outside-air temperature during the warm season.

9. Fenced-in block of connected buildings. Total area about 10,000 square meters. Yellow and red phosphorus and phosphorus compounds were produced in these buildings.

9a. Fenced-in area with U-shaped building, about 40 x 20 and 40 meters. This was an old workshop building which was still used as a PW camp in November 1948.

10. New sulphuric acid department. Building (a) was about 40 x 15 meters with 6 lead-lined towers, filled with Raschig (sic) rings. Building (b) was about 20 x 15 meters and was equipped with 8 automatic roasting furnaces. It was called "Department 52".

11. Several connected warehouses, covering a total area of about 120 x 15 meters, in which pyrite, rock salt, apatite, and graphite were stored.

12. New three-story building, about 20 x 20 meters, called "Ballon-Wirtschaft". This building was equipped with machines, probably pumps and tanks, including one tank which was 3 meters high and 2 meters in diameter. Pipe lines from the buildings 10a and 40 led to this installation. North of the building was an ammonia tank, about 5 meters high and 4 meters in diameter. Sulphuric acid, alcohol, and ammonia were brought to this installation from other workshops to be bottled in carboys.

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13. Old hydrochloric acid installation comprising 2 connected buildings, each about 50 x 20 meters.

14. New three-story building, about 30 x 15 meters. It had not yet been equipped as of April 1949.

15. Old boilerhouse for the steam and warm water supply, about 30 x 25 meters, equipped with four coal-fired fire-tube boilers.

16. Two sulphuric acid tanks.

17. Old pyrite roasting installation, about 30 x 15 meters, equipped with 12 furnaces, according to source.

18. Old sulphuric acid chamber installation (Schwefelsaeure-Kammeranlage), about 40 x 20 meters.

19. Superphosphate installation, about 85 x 20 meters.

20. Three sulphuric acid tanks, each about 6 meters high, and 6 meters in diameter. The tanks had cone-shaped iron roofs.

21. Sawmill, about 30 x 10 meters, used for the production of boxes, mainly for packing soda. The annex building was about 20 x 15 meters.

22. A building about 15 x 15 meters, used for the production of concrete items (Betonwaren). To the south were 2 small storage sheds.

23. New building, about 15 x 15 meters, with very large windows. Its equipment included 4 centrifugal pumps.

24. Three-story building, about 80 x 15 meters.

25. Three-story buildings, about 100 x 15 meters.

26. Three-story building, about 50 x 15 meters. The buildings identified as Nos 23, 24, 25 and 26 were used for ammonia synthesis and nitric acid production.

27. Tank installation, surrounded by many lightning conductors. The installation comprised the following tanks:

a) Two nitrogen tanks, each 16 meters high and with a capacity of 3,000 cubic meters.
b) Two hydrogen tanks, each 16 meters high and with a capacity of 3,000 cubic meters.
c) Mixed gas tanks, 16 meters high and with a capacity of 10,000 cubic meters.
d) Nitric acid tanks.

28. Installation, about 40 x 25 and 30 meters, for hydrogen production.

29. Old installation for chloric alkali electrolysis, about 55 x 40 meters, comprising several building sections.

30. Five buildings of various sizes housing installations for the production of nitrogen compounds. Nitride equipment used for the production of explosives was allegedly also installed in these buildings. This is indicated by the great number of lightning conductors near these buildings.

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31. Installation for the production of nitrogen fertilizers, consisting of two large buildings with storage sheds. The fertilizer material was packed in paper sacks for shipment.

32. Technical office building, about 30 x 15 meters.

33. Four-story building, about 28 x 15 meters, housing apprentice workshops in the basement, training and office rooms on the first and second floors, and storage rooms and laboratories on the third floor. The building was called "Technikum" and was frequented by young people wearing black uniforms marked F.S.O. ~~(sic)~~.

34. Garage, about 30 x 15 meters, beside a gate entrance.

35. Plant kitchen, about 25 x 10 meters.

36. Plant workshop buildings:

a. Latheshop, about 30 x 25 meters, equipped with 30 lathes and 1 traveling crane.
b. Forge, about 55 x 25 meters, equipped with several pneumatic hammers and four forges.
c. Boiler forge, about 40 x 15 meters, equipped with one traveling crane.
d. Three-story building, about 35 x 15 meters. It was an iron foundry with one furnace.

37. New installation, possibly a soda warehouse. It has been in operation since May 1949 and consisted of two walled towers each about 3.5 meters in diameter. The towers were lined with iron sheets on the inside tapering downwards in a funnel shape. The interior was divided into several floors. There was a short iron smokestack on the top. Nearby was a deep bunker which was filled with a white flour-like material unloaded from railroad cars. The Soviets called this material "lead silver" (sic). A conveying machinery moved this material to the towers.

38. Fire brigade station, a U-shaped building, about 30 x 25 meters. A first air station was in one wing while protective clothing and gasmasks were stored in the other one.

39. Three-story messhall building, about 60 x 30 and 15 meters. The eastern section was a two-story structure with waiting rooms for workers.

40. Three-story building, about 30 x 25 meters. It probably contained an installation for rectifying and concentrating alcohol.

41. Transformer station, a building about 30 x 25 meters. Open air transformers were installed in the fenced-in area surrounding the building. A high tension line led into this installation from the north.

42. Pattern-making shop of the foundry (item 36 d), a wooden barracks building, about 35 x 15 meters.

43. Building, about 30 x 15 meters, surrounded by a number of unidentified new structures.

44. Wooden shed, about 20 x 15 meters, with loading ramp.

45. Ruins of a large building. This was the former calcium chloride installation.

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46. Soda producing installation, a multiple-section building covering a total area of about 90 x 30 and 20 meters.

47. Workshop buildings, including a tailor shop. Protective clothing was also stored in these buildings.

48. Shoemaker and saddlery shop, about 30 x 15 meters.

49. U-shaped building, about 55 x 45 meters, warehouse for plant and packing material.

50. Salt refining installation, about 30 x 15 meters, with a wing about 20 x 15 meters.

51. Several buildings housing hydrochloric acid production installations, and hydrochloric acid adsorption towers.

52. Hydrochloric acid tank, about 12 meters in diameter.

53. Several large and small buildings containing oxygen and possibly nitrogen production departments, with filling installation.

54. Two buildings in a fenced-in enclosure, of about 105 x 70 meters containing the calcium carbide installation. Five electric furnaces, each 7 meters high and 3.5 meters in diameter were installed in the northern building.

55. Calcium chloride installation, about 60 x 25 meters.

56. Fence surrounding the plant, with a number of watchtowers. Field telephones for the use of the guards were installed at various points.

57. Large transformer installation comprising several buildings and open air transformers, covering a total area of about 18,000 square meters.

The use of the unnumbered buildings is not known.

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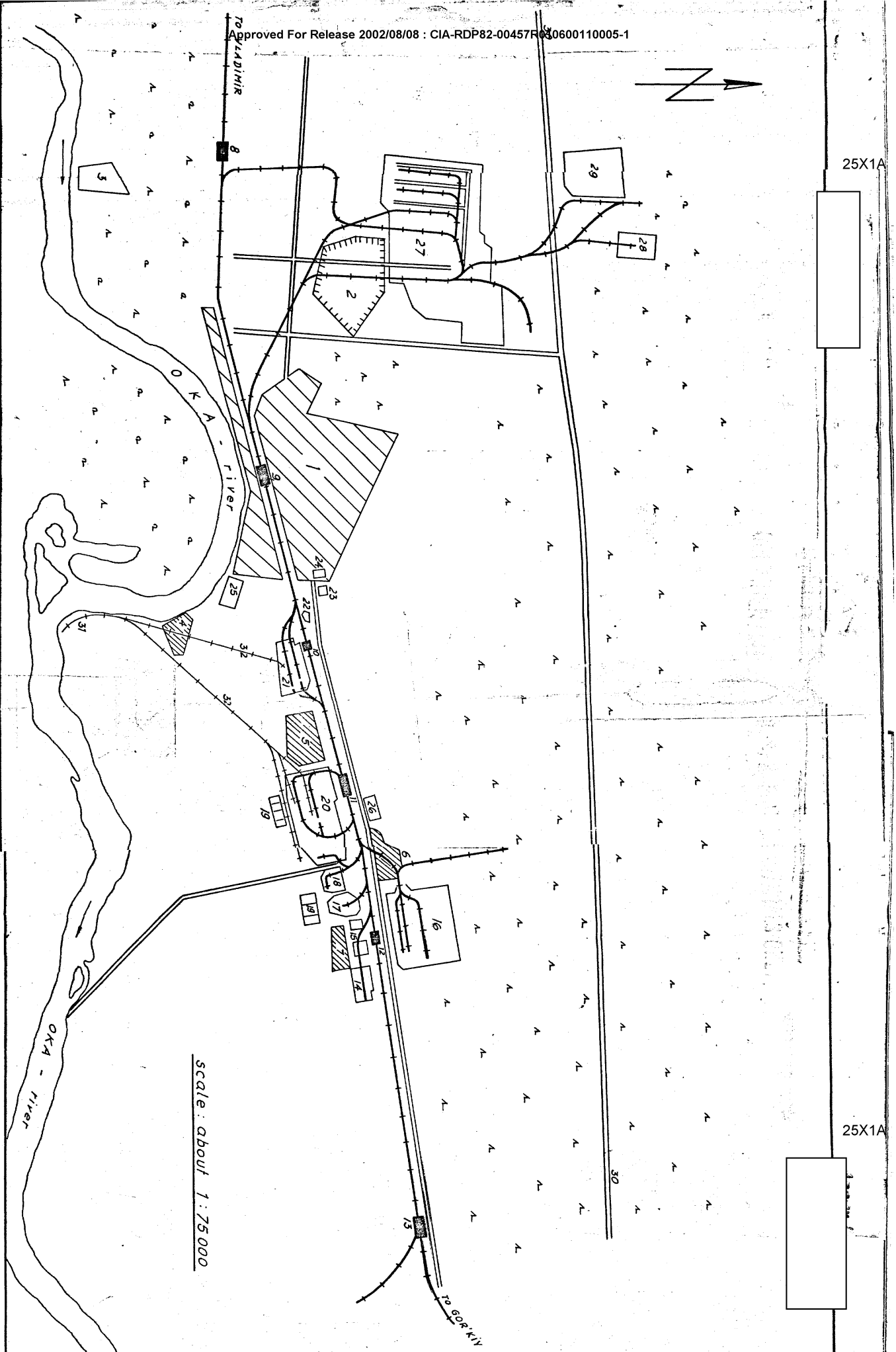

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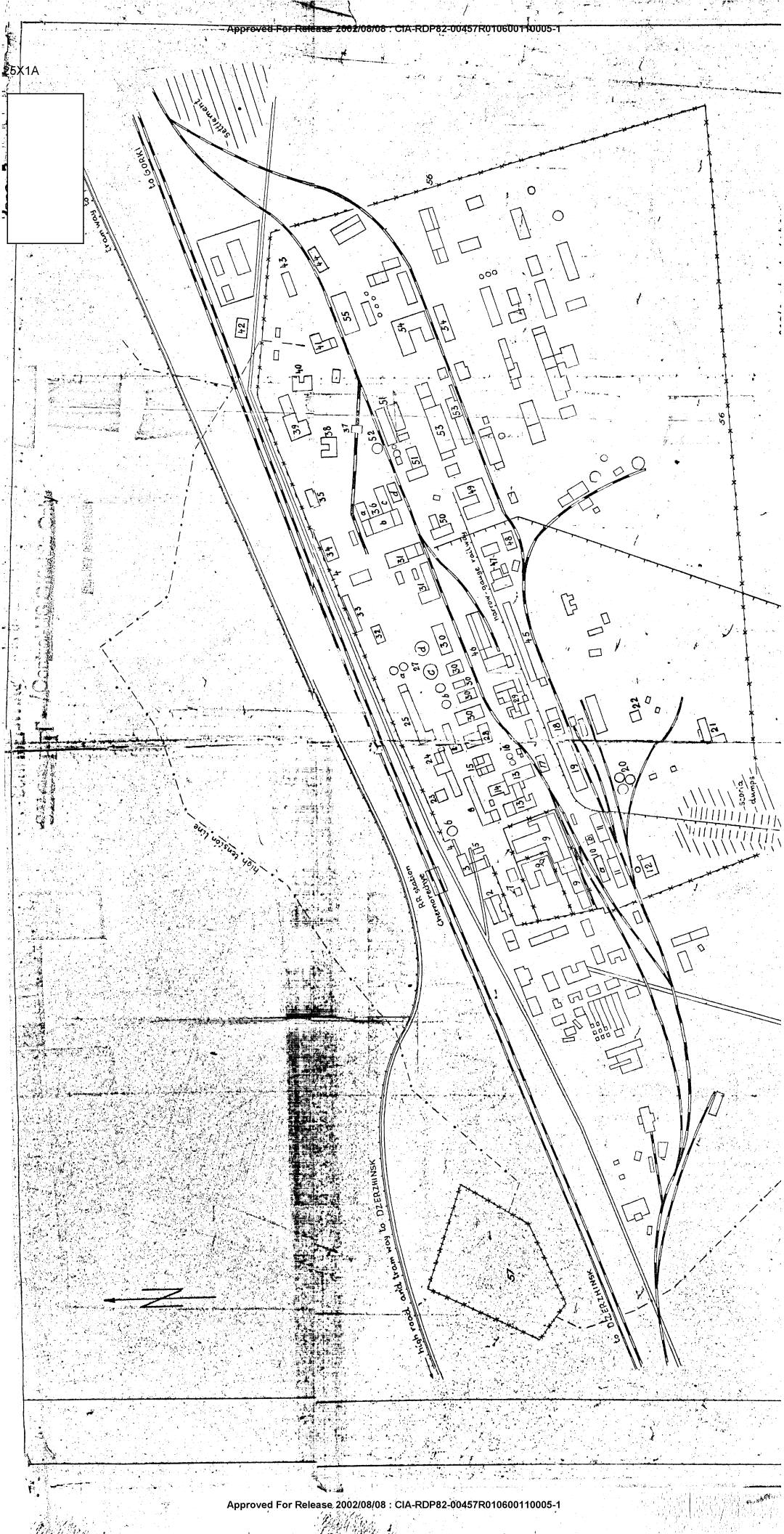

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